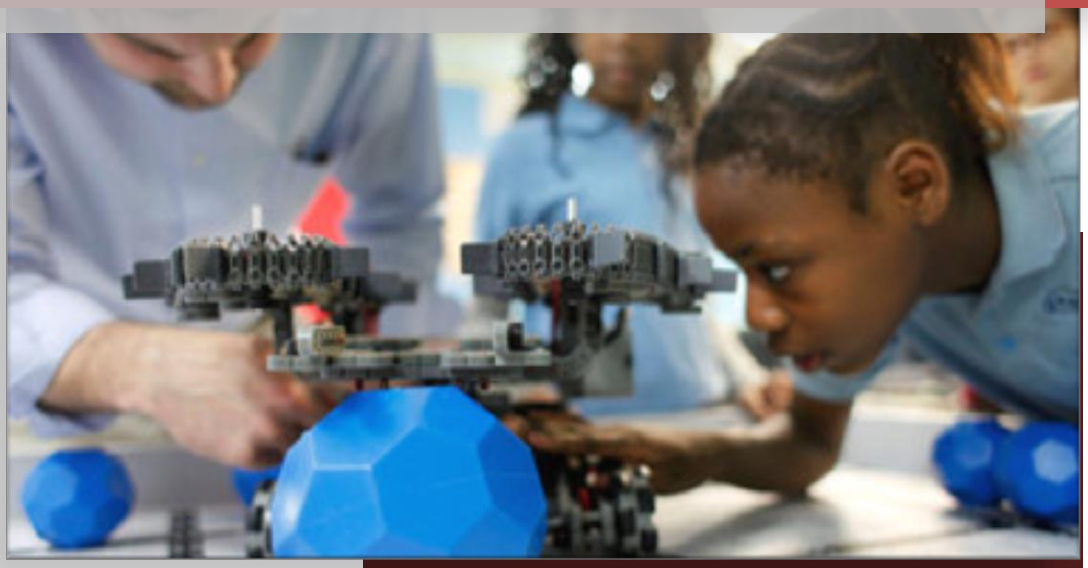
Career and College Ready

A Progress Analysis of Indiana's Career and Technical Education Programs



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Indiana Department of Education

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Introduction

Much attention has been given to Indiana's Career and Technical Education (CTE) courses and programs over the last two years. The creation of the Indiana Career Council and Indiana Works Councils provides new avenues for conversations and collaboration among education and workforce partners at the regional and state levels regarding the best ways of improving the college and career readiness of Hoosiers.

While clear targets are needed to effect meaningful change, it is important to understand the current state of Career and Technical Education in order to identify and expand upon existing strengths and to examine and strategize solutions where gaps and challenges remain.

Information in this report is organized into three broad areas:

- CTE Enrollment
- CTE Student Readiness - a factor of:
    - Academic Preparation – Graduation Rates and State Assessment Scores
    - Technical Skills Preparation – College and Career Pathways completion and performance on Exams and Skills Assessments
    - College and Career Readiness – Industry-Recognized Certifications and College Credits that CTE students earn
- CTE Alignment to Indiana's Economy

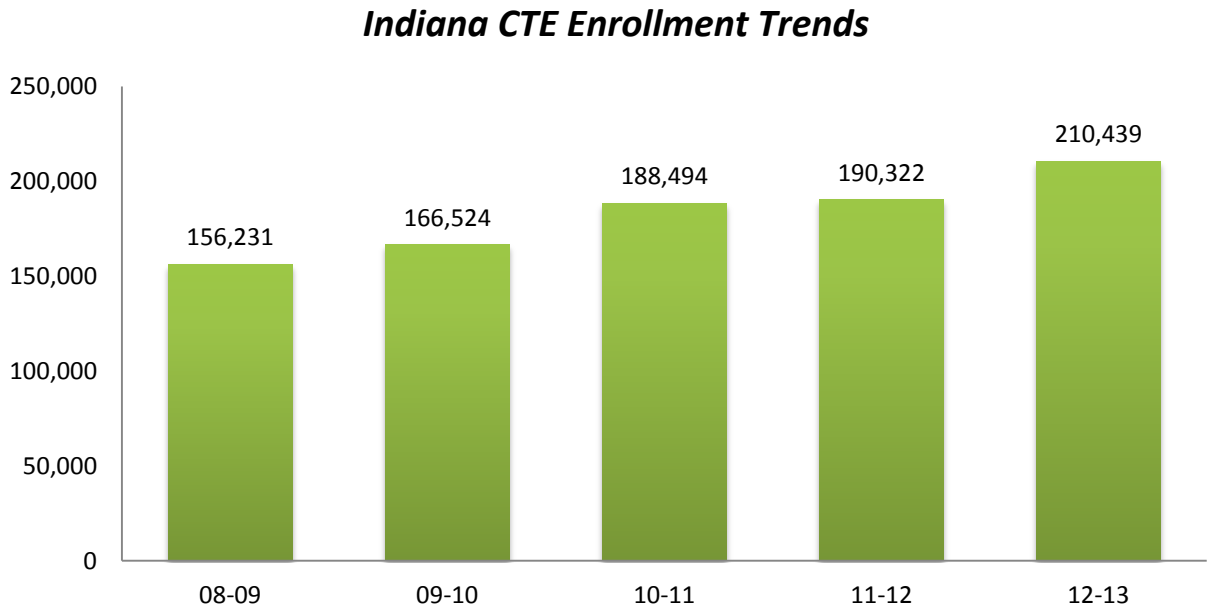
The CTE student performance data and labor market information presented in this report raise more questions than answers but provide a good starting point for hearty discussions about college and career readiness among local schools, area CTE districts, regional employers, postsecondary representatives and state leaders.

CTE Enrollment

1. *Two-thirds of all Indiana high school students are enrolled in one or more CTE courses*

The popularity of Career and Technical Education (CTE) courses in Indiana high schools continues to grow steadily each year. During the 2012-13 school year, a total of 210,439 students in grades 9-12 (66.6% of all high school students in the state) were enrolled in at least one CTE course.

2. *In the last five years, CTE enrollments have increased by 35%*



While total enrollments in grades 9-12 have been fairly consistent over the last five years—ranging between 315,580 in 2008 to 316,108 in 2013— the percentage of high school students enrolled in one or more CTE courses has risen persistently in the same period of time, from just under half of all students taking a CTE course in 2008 to 67% in 2013.

The five career areas that students choose to enroll in the most are listed on the next page.

Courses in the Health Services career cluster are on top, followed in popularity by Educational Services, Agriculture, Human Services and courses in the Science, Engineering and Technologies cluster rounding out the top five.

Ranking of Highest CTE Enrollments by Career Cluster

Rank	16 Nationally Identified Career Clusters	Enrollment
1.	Health Services	44,854
2.	Educational Services	32,931
3.	Agriculture, Food & Natural Resources	26,235
4.	Human Services	20,053
5.	Science, Engineering and Technologies (STEM)	17,427

CTE Student Readiness

Effective college and career preparation programs in high schools prepare students with:

- Academic Preparation – Ensuring students have the ability to read, write and communicate well, solve problems by applying mathematical concepts to real-life situations and have the reasoning capacity to know how to seek out answers and additional information when needed.
- Technical Skills – Employers in the technical fields prefer candidates with experience, especially in high tech areas. High school graduates who possess the skills, techniques and knowledge of Indiana's high wage, high demand and high-tech industry are better prepared for success.
- College and Career Readiness – A high school diploma is no longer sufficient evidence that a student is ready to succeed in postsecondary education or on the job. Earning dual credits and/or industry-based certifications while in high school are better indicators of how well students are prepared for "the next step."

The next few pages provide a summary of Indiana CTE student performance in 2012-13 organized into each of these three areas based upon available indicators and data.

Academic Preparation

High school graduation rates and performance on the state's high school ISTEP+ assessments (called End of Course Assessments or ECAs) are two of the most common indicators of students' academic knowledge and preparation.

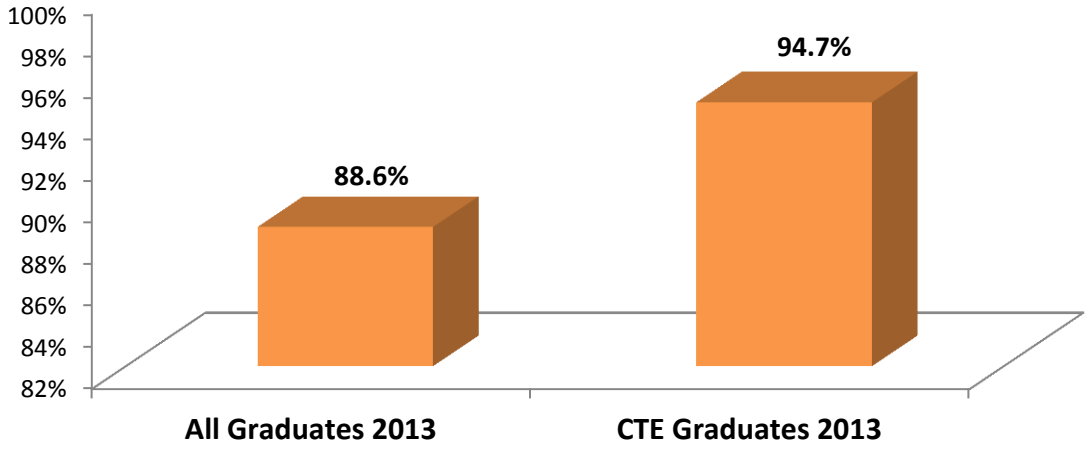
3. *Indiana CTE graduates recorded their highest graduation rate ever in 2013*

Graduation Rates

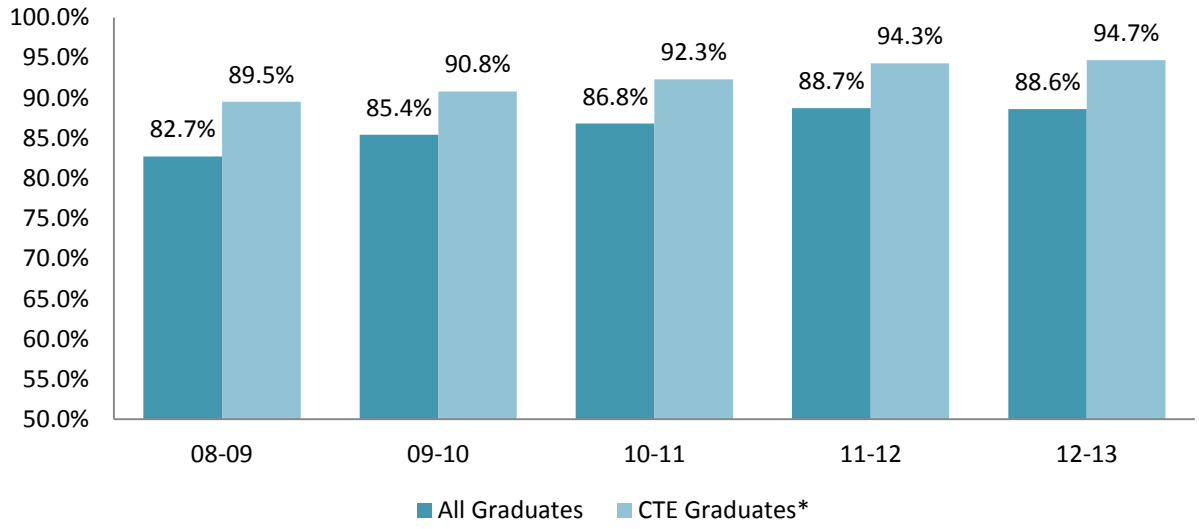
High school graduation rates for CTE students who are concentrators (those who have earned at least six credits in a CTE pathway) averaged 94.7% in 2013, the highest graduation rate ever recorded for CTE students in the state. That was 6% higher than Indiana's 88.6% overall graduation rate for all high school students. Note that graduation rates reported in the charts below include students who graduated with waivers.

4. *The graduation rate for CTE concentrators in 2013 was 6% higher than the state average for all students*

All Student and CTE Student Graduation Rate Comparisons



All Student and CTE Student Graduation Rate Trends



**CTE Graduates are CTE concentrators who have completed six credits in a CTE Pathway*

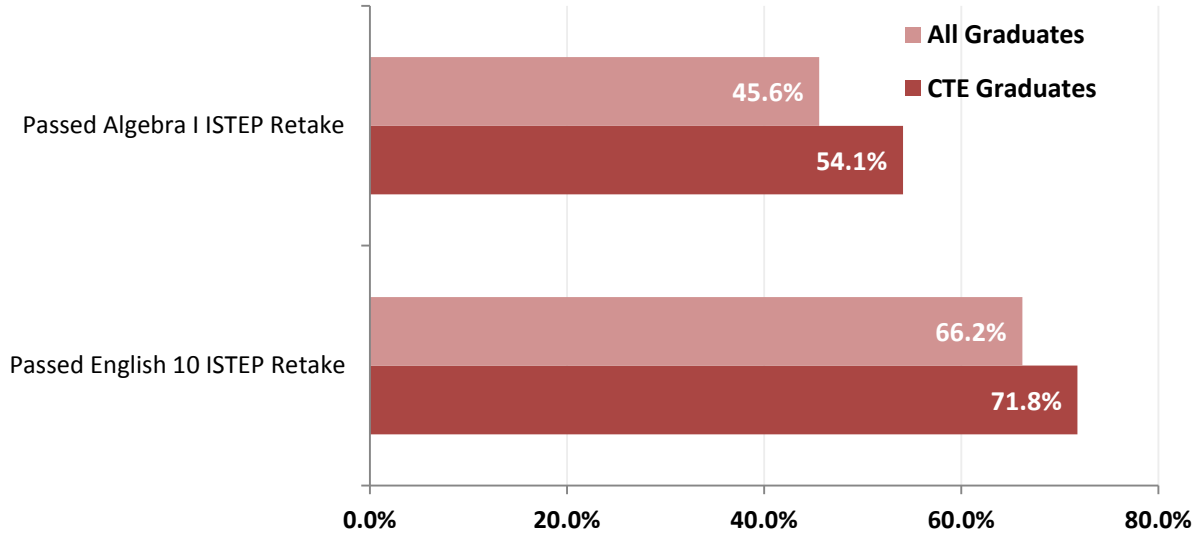
State Assessment Scores

Another indicator of student academic preparation is the passage rate of students taking the state's required graduation examinations, or end-of-course assessments (ECAs), in Algebra I and English 10.

Most ECA assessments are administered in a student's 9th or 10th grade year, well before they become a CTE concentrator, yet CTE programs embed English and math lessons into the career preparation curriculum in order to help students who have not passed the ECAs do so by the time of graduation.

Whether it is these academic lessons or a combination of other factors, senior CTE student concentrators outperform all other students when it comes to passing ECA exams.

CTE Graduate ECA Passage Percentage Compared to All Graduates



5. *CTE graduates have significantly higher ECA graduation examination passage rates than all other seniors*

Technical Skills

Indiana aligns its CTE courses into sequences called College and Career Pathways. Ideally, students take a broad career exploratory course, such as *Preparation for College and Careers*, in the 8th or 9th grade followed by one or more introductory CTE courses in 9th and 10th grades. The introductory courses, such as *Introduction to Advanced Manufacturing* or *Introduction to Construction*, allow students to consider one or two areas of interest in greater depth before moving to the 11th and 12th grade courses that are typically multi-hour, skills-based courses that

provide more specific training in a particular area. These courses often allow students to earn college credits or an industry certification while incorporating work-based learning experiences.

College and Career Pathway Programs

When looking at all 48 of the area Career and Technical Education Districts across the state, the most commonly offered program in 2012-13 was Automotive Services Technology, which was a choice for students in 38 of the 48 districts. Other frequently offered programs were Comprehensive Health Science, Construction Trades and Cosmetology.

CTE Pathway Programs	Total Number of Districts Offering Programs Out of all 48 Indiana CTE Districts
Automotive Services Technology	38
Comprehensive Health Science	36
Construction Trades	34
Cosmetology	30
Culinary Arts	29
Welding	29
Early Childhood Education	27
Auto Collision Repair	26
Machine Trades Technology	25
Engineering and Project Lead the Way	24
Graphic Arts	24

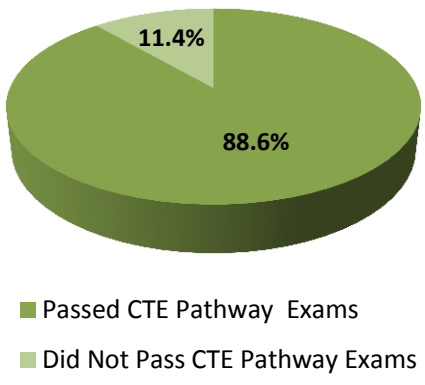
The table in Appendix B summarizes the Career Cluster programs offered around the state in 2012-13.

6. *The most frequently offered CTE Pathways in the state are related to careers in Automotive, Health and Construction*

Pathway Exams and Skills Assessments

Every CTE Pathway program includes a technical skills assessment or "Pathway exam" to measure student mastery of technical skills and content in a specific content area. Many assessments are industry-recognized certifications such as the Manufacturing Skills Standards Council (MSSC) certification or the credentials from the American Welding Society (AWS).

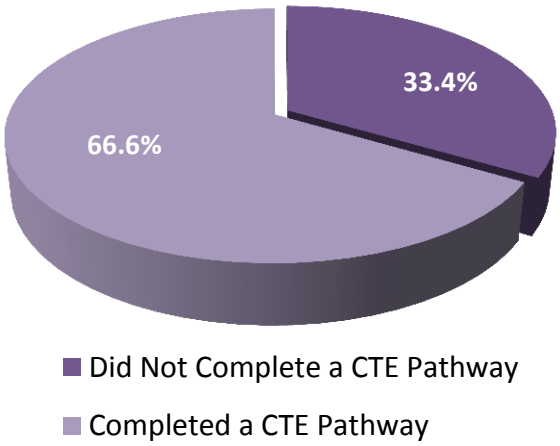
The statewide Pathway exam passage rate in 2012-13 was 88.6%.



Students in Project Lead the Way (PLTW) pre-engineering and biomedical science programs sat for the highest number of Pathway exams followed closely by students who took the Certified Nurse Aide exam, CPR certification, Indiana Certified Nursing Assistant (CNA) exam, Automotive Service Excellence (ASE) certification and the NOCTI exam for Early Childhood Education.

7. *88.6% of CTE students passed their Pathway Exams*

A detailed breakdown of the specific certifications and credentials CTE students earned in 2012-13 and the associated percent passage rates can be found in Appendix C. More details about industry-recognized certifications are provided later in this report.



Pathway Completion

CTE students are considered Pathway completers when they have earned a minimum of six course credits in a single College and Career Pathway and have taken the corresponding Pathway exam designated by the state.

13,553 CTE students—or two-thirds of all CTE concentrators—met the standards for being considered a Pathway completer in 2012-13.

8. *66.6% of CTE students completed a College and Career Pathway*

College and Career Readiness

Perhaps the most critical measure of student performance in high school CTE programs is whether students are successful in transitioning to work or to postsecondary training (e.g. military, apprenticeship, certification and two- or four-year college) after graduation.

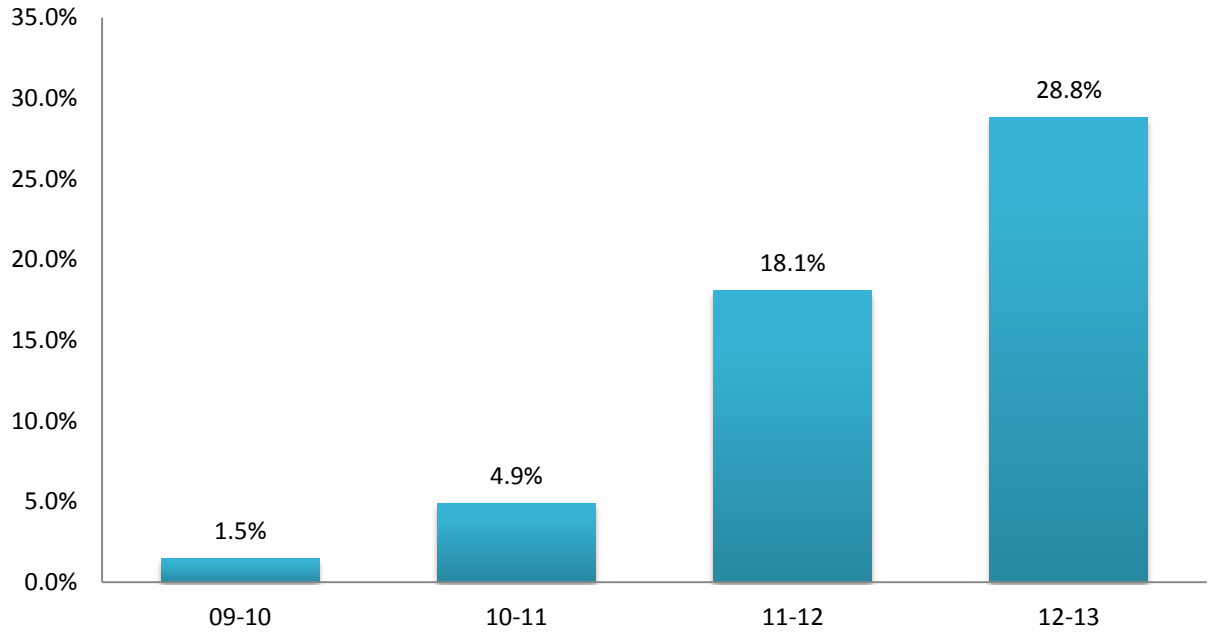
Measuring readiness for college and careers is an imperfect science but indicators such as the number of college credits and industry-based certifications students earn while in high school are two common indicators used around the country.

Industry-Recognized Certifications

Indiana CTE districts have made a concerted effort to embrace and expand the number and percent of students who earn an industry-recognized certification in Pathway programs. In just five years, the state's percentage of CTE graduates earning a certification or credential has

dramatically risen from a handful of students to a total of 7,500 CTE graduates leaving high school with a credential valued by employers. Almost one-third (28.8%) of CTE graduates earned an industry-recognized credential in 2012-13, a dramatic increase over the year before.

Percent of CTE Graduates with an Industry-Recognized Credential



9. Almost one-third of Indiana CTE graduates left high school with an industry- recognized certification in 2012-13

Though all states are required to use technical skills assessments to measure student progress in CTE programs, the assessments that are used vary widely from state to state. For example, few states use actual industry-recognized certifications and credentials for these measures and even fewer offer the large number of certifications that Indiana does.

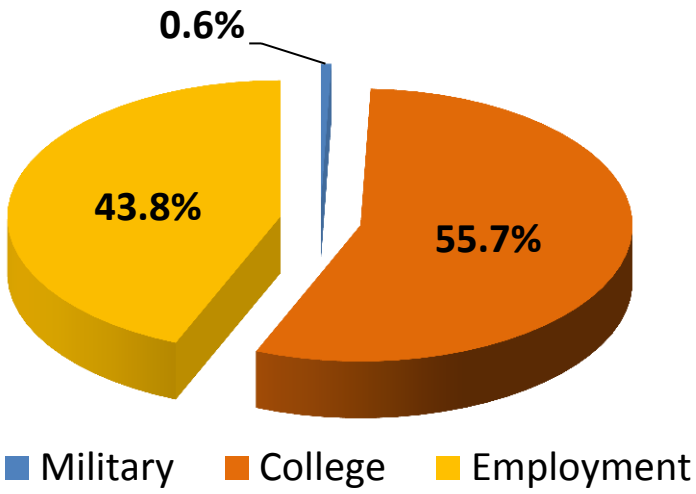
Continued conversations with regional employers on CTE Advisory Boards and the Indiana Works Councils around the state can help clarify which certifications and credentials are of highest value to regional and state employers.

Area CTE districts are also working to raise passage rates and performance on the credentialing exams in the areas of manufacturing, construction and automotive and in the emergency medical technician (EMT) certification process.

Post-High School Transition to College or Career

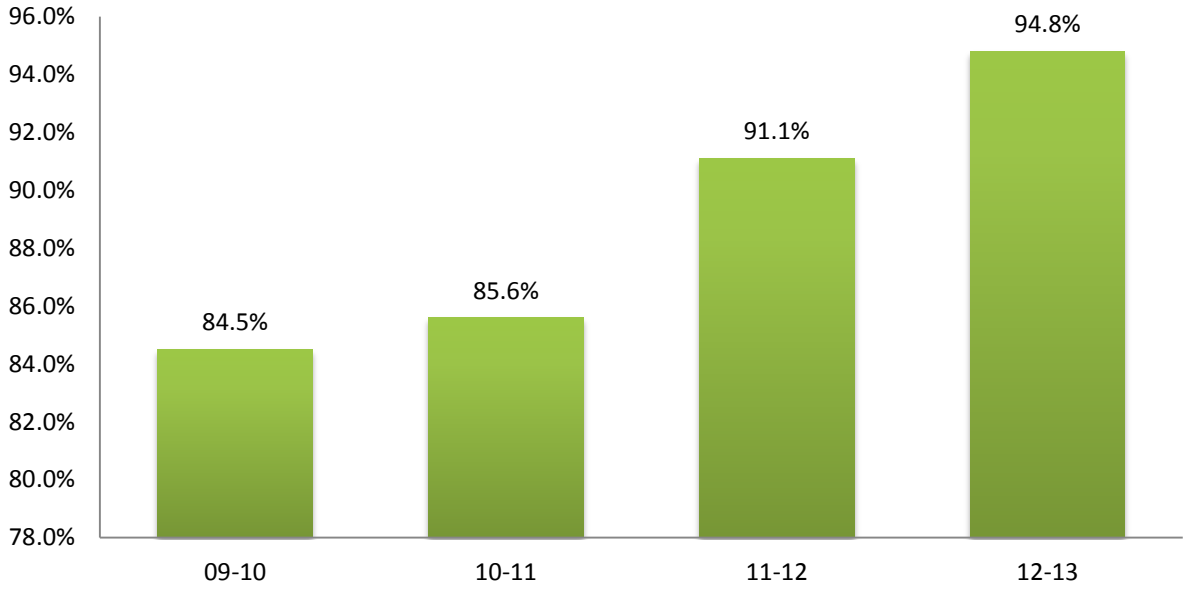
Within six months after graduating high school, the percentage of CTE concentrators who find employment, enlist with the military or enter postsecondary education is 94.8%. The majority of graduates (55.7%) enroll in a two- or four-year college (compared to a 66% college-going rate for all students), while 43.8% find employment. Only a small percentage of CTE graduates enlist in the military.

Percentage of CTE Graduates Transitioning to College or Career



Over the last four years, data indicates a steady upward trend of CTE graduates entering either the workforce or pursuing college or other postsecondary education—a possible reflection of the economic recession.

CTE Graduates Transitioning to College or Career Trends

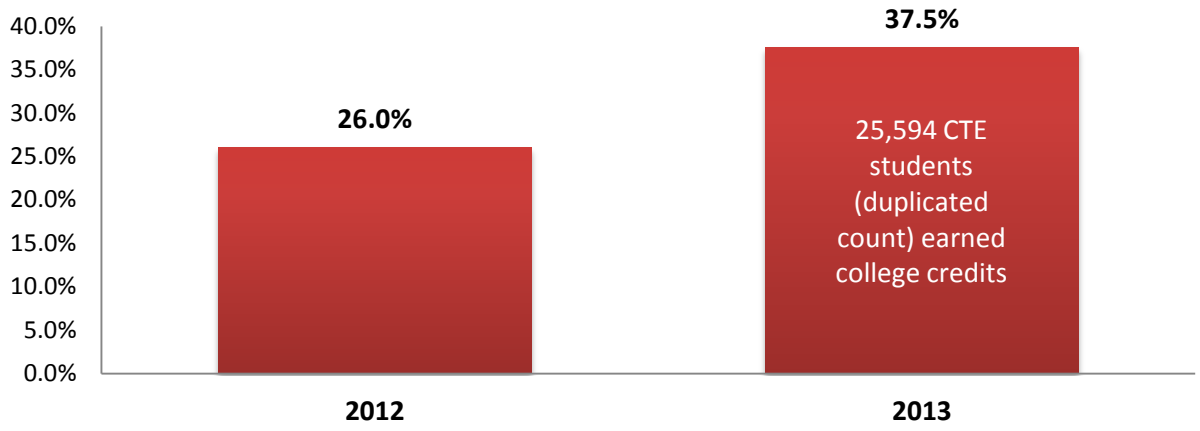


College Credits

An increasing number of CTE students earn college credits before graduating high school. Just in the last year, the percentage of CTE graduates earning college credits rose by more than 10% from 26.0% to 37.5%, the highest rate ever recorded.

10. *The percentage of CTE graduates earning college credits while in high school rose more than 10% from 2012 to 2013*

Percent of CTE Graduates Earning College Credits in High School

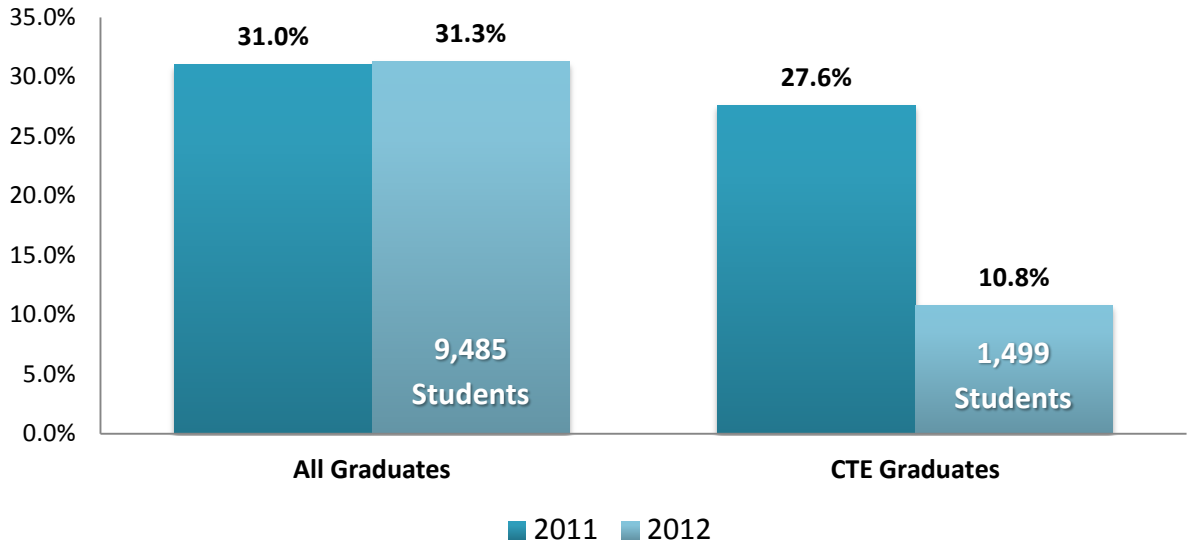


Another bright note regarding CTE graduates' transition to college and postsecondary education is found in the college remediation figures. Note that remediation data is unlike other data. It is one-year "behind" because it measures how the previous high school graduating class performed during the first year of college. Also, unlike other data, lower percentages in the area of remediation are a positive sign. Lower remediation rates mean more students were prepared for college-level work, were enrolled in college credit-bearing courses and therefore did not require a remedial college course (which typically does not result in a college credit).

With that in mind, note that in the bar graph on the next page 31.3% of all Indiana high school graduates in 2012 were required to take at least one remedial course during their first year of college, while remediation rates for CTE graduates were 20 percentage points better at 10.8%. Said another way, the average Indiana high school senior going to college last year was three times more likely to take a remedial course than a senior who was a CTE concentrator.

Trend data shows that this is a pattern that has continued for several years. First-year college retention rates for CTE graduates (correlated to better remediation rates) have consistently been better than the state average.

First-Year College Remediation Rates for CTE Graduates Compared to All Graduates



11. *College remediation rates for CTE graduates are consistently better than remediation rates for all other students*

The college credits that Indiana students earn in high school by completing college-level career preparation courses not only benefit students but also their parents, in significant ways.

Indiana colleges and postsecondary institutions waive the normal college tuition costs of college-level career courses taught in high schools, saving students and their parents as much as $345 for every dual credit college course a student completes. In the 2012-13 school year, the Department of Workforce Development reports that 25,594 students earned at least one college credit in career preparation courses. Though some of the college credits were only one credit hour courses, many were two and three credit hour courses.

Using conservative student figures and Ivy Tech Community College's 2013 per credit hour tuition cost of $116.15 (a figure used because Ivy Tech reportedly has the lowest college tuition rate in the state), total tuition savings to parents in 2013 totaled more than $2.9 million dollars.

12. *Parents of students completing CTE dual college credit courses saved $2.9 million dollars in college tuition costs in 2013*

CTE Alignment to Indiana's Economy

The Indiana Department of Education believes that all work has value and that Indiana's students should be supported in preparing for whatever career(s) they choose. Given the positive outcomes from Indiana's Career and Technical Education students, that philosophy appears very wise.

Recently, state leaders have begun discussing the alignment of CTE programs with the expanding workforce needs of Indiana's economy. Conversations about the Return on Investment (ROI) of state and federal CTE funding have raised many questions, including:

- Should the state limit what careers students should aspire toward and prepare for?
- What career preparation programs should be considered the most valuable?
- Given the success rate of Indiana's CTE students, should all students be on a career pathway whether matriculating to college after graduation or going directly to work?
- What is the value of a career program that may not lead directly to high-wage careers, but allows students to earn money as they pursue college and postsecondary training?
- If some career programs should be kept and others changed or eliminated, what criteria should be used to make these determinations?

What Data Should Be Used?

One challenge of more closely linking CTE programs with workforce and economic demands is determining what specific occupational data should be used. Many believe the focus should be on occupations with the highest demand and pay at least a living wage.

But as the table below illustrates, even the lists of the top five highest wage and demand occupations projected for Indiana in the next ten years by the federal Bureau of Labor Statistics (top row) vary considerably when ranked by demand versus wages. So too do the lists of the top five job postings by employers across Indiana last year recorded by the Department of Workforce Development's Job Postings and Starting Wages report (second row). Though all four lists offer insights on high-wage and high-demand occupations, there is little consensus.

A1: BLS Projected Openings Ranked by Demand	A2: BLS Projected Openings Ranked by Wages
1) Maintenance and repair workers, general 2) Sales representatives, wholesale and manufacturing, except technical 3) First-line supervisors/managers of production and operating 4) Customer service representatives 5) Inspectors, testers, sorters, samplers, weighers	1) Secondary school teachers, except special and vocational education 2) Physicians and surgeons, all other 3) Top executives 4) Dentists, general 5) Pharmacists
B1: DWD 2013 Job Postings Ranked by Demand	**B2: DWD 2013 Job Postings Ranked by Wages**
1) Heavy and tractor-trailer truck drivers 2) Insurance sales agents 3) Sales representatives, services, all other 4) Industrial truck and tractor operators 5) Managers, all other	1) Personal financial advisors 2) Chief executives 3) Marketing managers 4) Software developers, applications 5) Software developers, systems software

Both sets of data used in the table on page 14 were compiled according to wages above $15.00 per hour and demand of at least 100 annual, statewide job openings. The $15.00 per hour wage criteria corresponds to the Indiana Institute of Working Families' Self-Sufficiency Standard Calculator for the minimum hourly wage required to sustain one adult with one pre-school aged child ($16.51/hour in Marion County), while the 100 job openings demand data approximates one job opening per year in each of Indiana's 92 counties.

Appendix D provides expanded ranked lists from the Indiana Department of Workforce Development's Job Postings and Starting Wages report (which provides a summary of the actual job postings in 2013 by Indiana employers plus the average annual wages of employees in those jobs), and the Bureau of Labor Statistics' (BLS) Long-Term Occupational Projections for 2012 to 2022 (a predictive tool used across the country to project where job openings and wages will be in the next ten years). The BLS data also aligns with Indiana's Hoosier Hot 50 Jobs list.

Summary

Efforts over the last several years to highlight the benefits of CTE in Indiana are well-deserved. Looking solely at the data in this report, CTE student outcomes and performance trends are quite remarkable. In many ways, more attention should be given to the positive, consistent benefits to students from completing a career pathway program.

Examining the alignment of CTE programs with the economic demands of the state can provide opportunities for constructive conversations, as long as there is consensus around what criteria and data are used to make those judgments. State and regional leaders must also consider how potential changes to programs could affect student motivation, enrollment and engagement—factors that appear to be strongly correlated to the positive student performance outcomes highlighted in this report.

Digging deeper into the reasons why Indiana students who complete a sequence of CTE courses outperform their peers is beyond the scope of this report. However, it seems logical that students succeed at higher rates when they are engaged in active versus passive learning, in areas they find interesting and enjoyable and when they are completing rigorous college courses and work-based learning experiences that connect them with the "real world." Perhaps this is the way all education should work.

Appendix A
Sources

InTERS Student Data College System, Indiana Department of Workforce Development

COMPASS Data System, Indiana Department of Education

Indiana Commission for Higher Education, College Readiness Reports

Indiana CTE Data Profile, Indiana Department of Workforce Development

Indiana Department of Workforce Development, Job Postings & Starting Wages Report, 4th Quarter 2013 at http://www.hoosierdata.in.gov/publookup

US Bureau of Labor Statistics, 2012-2022 Long-Term Projections for Indiana at http://www.bls.gov/oes/current/oes_in.htm

Appendix B

Number and Type of Career Clusters Offered in Indiana in 2012-13

Indiana Career Clusters - ALPHABETICAL	Number of Programs Available
AGRICULTURE CLUSTER	30
ARCHITECTURE & CONSTRUCTION CLUSTER	81
ARTS, AV TECHNOLOGY & COMMUNICATIONS CLUSTER	63
BUSINESS & MARKETING CLUSTER	42
EDUCATION & TRAINING CLUSTER	37
HEALTH SCIENCE CLUSTER	79
HOSPITALITY & HUMAN SERVICES CLUSTER	66
INFORMATION TECHNOLOGY CLUSTER	46
MANUFACTURING & LOGISTICS CLUSTER	107
PUBLIC SAFETY CLUSTER	44
TRANSPORTATION CLUSTER	92

Indiana Career Clusters – BY HIGHEST NUMBER OF CLUSTERS	Number of Programs Available
MANUFACTURING & LOGISTICS CLUSTER	107
TRANSPORTATION CLUSTER	92
ARCHITECTURE & CONSTRUCTION CLUSTER	81
HEALTH SCIENCE CLUSTER	79
HOSPITALITY & HUMAN SERVICES CLUSTER	66
ARTS, AV TECHNOLOGY & COMMUNICATIONS CLUSTER	63
INFORMATION TECHNOLOGY CLUSTER	46
PUBLIC SAFETY CLUSTER	44
BUSINESS & MARKETING CLUSTER	42
EDUCATION & TRAINING CLUSTER	37
AGRICULTURE CLUSTER	30

Appendix C

Certifications, Certificates and Credentials Earned by CTE Students

Certification Name	% Passing versus # Taken	# Students Earning
Certified Nurse Aide	99.9%	929
Indiana State Certified Nursing Assistant (CNA)	93.9%	898
Healthcare Provider CPR Certification - American Heart Assn/Red Cross	89.5%	786
National Healthcare Foundation Skills Assessment	76.3%	293
State Board of Cosmetology	97.9%	235
Automotive Service Excellence (ASE) Certification	52.4%	220
American Welding Society (AWS) Certification	90.8%	208
Pro-Start National Certificate of Achievement-National Restaurant	88.8%	175
Automotive Service Excellence (ASE) Student Certification	55.9%	142
A Plus Certification	70.6%	75
Manufacturing Skill Standards Council (MSSC) - Certified Production	59.4%	60
Home Builders Institute Basic Principles of Construction	52.0%	51
Automotive Service Excellence (ASE) Certification- Electrical/Electronic	81.1%	43
Automotive Service Excellence (ASE) Certification- Suspension & Steering	59.4%	41
Manufacturing Skill Standards Council (MSSC) - Safety	62.5%	40
Automotive Service Excellence (ASE) Certification- Brakes	48.2%	40
OSHA General Certification	100%	33
IC3 Certification (Internet and Computing Core Certification)	100%	32
Firefighter 1 Certification	88.0%	22
Home Builders Institute (HBI) Basic Carpentry	26.8%	19
Emergency Medical Technician (EMT)	35.9%	19
OSHA 10 + 30 General Industry; IDHS First Responder; Lockout/Tagout; Forklift licensure	81.8%	18
National Institute for Metalworking Skills (NIMS)	89.5%	17
Limited Dental Radiographer	100%	17
PrintED Certification	53.9%	14
AWS MIG (GMAW) Certification	87.5%	14
AWS STICK (SMAW) Certification	81.3%	13
Microsoft Office Specialist Certification	48.0%	12
Firefighter 2 Certification	70.6%	12
Manufacturing Skill Standards Council (MSSC) - Processes and Production	57.9%	11
Automotive Service Excellence (ASE) Certification- Engine Repair	42.9%	9
Home Builders Institute (HBI) Basic Wiring	25.0%	9
EPA Type I CFC license	12.5%	3

Appendix D

Comparisons of the Top 25 Indiana Occupations

based on Wage and Data Criteria from the US Bureau of Labor Statistics (BLS) 2012-2022 Long Term Occupational Projections (A1 and A2) and the Indiana Department of Workforce Development's Job Postings and Starting Wages report for 2013 (B1 and B2)

A1. BLS Projected Openings 2012-2022 – Ranked by Openings

Based on minimum $15/hour mean hourly wage and 100 Annual Avg Total Openings. Ranked by highest Annual Average Total Openings by occupational title only, not category.

	BLS Occupational Title	Mean Hourly Wage	Annual Avg Total Openings
1	Maintenance and repair workers, general	$18.01	3,162
2	Sales Res, Wholesale & Manufacturing, except Technical	$30.72	3,140
3	First-Line Supervisors/Managers of Production and Operating	$26.19	2,706
4	Customer Service Representatives	$15.82	2,472
5	Inspectors, Testers, Sorters, Samplers, and Weighers	$16.87	2,326
6	Service Unit Operators, Oil, Gas, and Mining	$18.75	1,747
7	Truck Drivers, Heavy and Tractor-Trailer	$19.71	1,630
8	Wellhead Pumpers	$16.76	1,615
9	Bookkeeping, Accounting, and Auditing Clerks	$16.47	1,572
10	First-Line Supervisors/Managers of Office and Administrative	$23.69	1,405
11	Secretaries, Except Legal, Medical, and Executive	$15.40	1,403
12	Industrial Production Managers	$41.01	1,376
13	General and Operations Managers	$51.66	1,354
14	Fashion Designers	$25.53	1,230
15	Accountants and Auditors	$31.19	1,121
16	Industrial Truck and Tractor Operators	$15.85	1,026
17	Molding, Coremaking, and Casting Machine Setters, Operators,	$15.65	997
18	Property, Real Estate, and Community Association Managers	$25.71	990
19	First-Line Supervisors/Managers of Construction Trades	$29.57	962
20	Carpenters	$19.72	911
21	First-Line Supervisors/Managers of Retail Sales Workers	$18.29	838
22	Industrial Machinery Mechanics	$23.77	813
23	Managers, All Other	$32.20	805
24	Graphic Designers	$19.57	753
25	Industrial Engineers	$34.35	749

A2. BLS Projected Openings 2012-2022 – Ranked by Wage

Based on minimum $15/hour mean hourly wage and 100 Annual Avg Total Openings. Ranked by highest Mean Annual Wage and including both occupational title and occupational categories.

	BLS Occupational Title	Mean Hourly Wage	Annual Avg Total Openings
1	Secondary School Teachers, Except Special and Vocational Edu	*	579
2	Physicians and Surgeons, All Other	$105.35	240
3	Top Executives	$84.30	1,949
4	Dentists, General	$75.93	108
5	Pharmacists	$54.26	216
6	Engineering Managers	$53.98	122
7	Air Transportation Workers	*	145
8	General and Operations Managers	$51.66	1,354
9	Computer and Information Systems Managers	$50.68	202
10	Marketing Managers	$50.40	230
11	Financial Managers	$49.34	390
12	Computer Specialists	$49.18	2,460
13	Sales Managers	$49.18	504
14	Lawyers	$47.70	212
15	Human resources managers	$46.88	220
16	Management Occupations	$44.37	9,010
17	Purchasing Managers	$43.91	238
18	Sales Representatives, Wholesale & Manufacturing, Technical	$42.89	217
19	Medical and Health Services Managers	$41.39	244
20	Industrial Production Managers	$41.01	1,376
21	Software developers, applications	$40.99	264
22	Construction Managers	$39.62	197
23	Transportation, Storage, and Distribution Managers	$39.32	161
24	Physical Therapists	$38.93	154
25	Management Analysts	$38.91	328

B1. DWD Job Postings and Starting Wages for 2013 – Ranked by Openings

Based on minimum $15/hour average hourly wage and 100 Annual Total Openings. Ranked by highest Total Openings.

	Occupational Title	Total Openings	Avg Hourly Wage
1	Heavy and Tractor-Trailer Truck Drivers	5,363	$21.01
2	Insurance Sales Agents	3,493	$26.79
3	Sales Representatives, Services, All Other	1,675	$29.43
4	Industrial Truck and Tractor Operators	1,379	$16.47
5	Managers, All Other	1,249	$20.83
6	Registered Nurses	1,248	$21.26
7	Sales Managers	1,154	$34.51
8	Maintenance and Repair Workers, General	994	$15.51
9	Licensed Practical and Licensed Vocational Nurses	932	$16.54
10	First-Line Supervisors of Production and Operating Workers	684	$18.75
11	Engineers, All Other	582	$33.83
12	Electricians	526	$20.96
13	Construction Carpenters	514	$16.99
14	Maintenance Workers, Machinery	438	$17.43
15	Industrial Machinery Mechanics	431	$19.94
16	Electrical and Electronics Repairers, Commercial and Industrial Equipment	417	$17.15
17	Healthcare Practitioners and Technical Workers, All Other	397	$18.86
18	Bus and Truck Mechanics and Diesel Engine Specialists	387	$16.07
19	Mechanical Engineers	325	$37.09
20	Accountants	319	$16.41
21	Chief Executives	315	$53.45
22	Computer User Support Specialists	292	$19.63
23	Manufacturing, Except Technical and Scientific Products	290	$21.73
24	Marketing Managers	279	$44.97
25	Plumbers	278	$19.49

B2. DWD Job Postings and Starting Wages for 2013 – Ranked by Wage

Based on minimum $15/hour average hourly wage and 100 Annual Total Openings. Ranked by highest Average Hourly Wage.

	Occupational Title	Total Openings	Avg Hourly Wage
1	Personal Financial Advisors	247	$59.50
2	Chief Executives	315	$53.45
3	Marketing Managers	279	$44.97
4	Software Developers, Applications	274	$39.37
5	Software Developers, Systems Software	170	$37.49
6	Mechanical Engineers	325	$37.09
7	Occupational Therapists	152	$36.91
8	Electrical Engineers	137	$36.62
9	Industrial Engineers	126	$34.96
10	Sales Managers	1,154	$34.51
11	Engineers, All Other	582	$33.83
12	Computer Programmers	152	$32.97
13	Management Analysts	116	$32.93
14	Financial Specialists, All Other	101	$32.54
15	Airline Pilots, Copilots and Flight Engineers	102	$31.56
16	Physical Therapists	148	$31.20
17	Sales Representatives, Services, All Other	1,675	$29.43
18	Manufacturing Engineers	133	$29.19
19	Insurance Sales Agents	3,493	$26.79
20	Chemists	139	$26.60
21	Boilermakers	148	$25.60
22	Construction Managers	167	$24.29
23	Financial Analysts	116	$23.74
24	Education Administrators, Postsecondary	135	$23.63
25	Medical and Health Services Managers	168	$23.27